

Claims

1. A method of forming a nanowire comprising:
 - (a) providing an arrangement of nanoparticles comprising a first material;
 - (b) providing a fluid of molecules;
 - (c) depositing at least some second material from said fluid of molecules onto an exterior surface of one of said nanoparticles to form a deposit which surrounds at least part of the exterior of said one nanoparticle; and
 - (d) assembling more of said first material from said nanoparticles with said one nanoparticle to produce an elongate configuration of said first material in the form of a nanowire.
2. A method of forming a nanowire according to claim 1, wherein said first material is a ferromagnetic material.
3. A method of forming a nanowire according to claim 2, wherein the ferromagnetic material is selected from the group consisting of the metals cobalt, nickel, platinum, palladium and iron, and the alloys containing at least one of said metals.
4. A method of forming a nanowire according to any preceding claim, wherein the second material comprises carbon.
- 25 5. A method of forming a nanowire according to claim 4, wherein said fluid of molecules comprises fluorocarbon molecules.
6. A method of forming a nanowire according to any preceding claim, wherein said fluid of molecules comprises decomposition products produced from a polymer.

7. A method of forming a nanowire according to any preceding claim, wherein the fluid is provided in the form of a vapour.

8. A method of forming a nanowire according to claim 6 and 7,
5 wherein the method comprises applying a temperature sufficient to decompose the polymer to form a vapour and insufficient to cause coalescence of the nanoparticles.

9. A method of forming a nanowire according to claim 8, wherein
10 the temperature is below 600°C.

10. A method of forming a nanowire according to claim 8 or 9,
wherein the temperature is above 100°C.

15 11. A method of forming a nanowire according to claim 9 and 10,
wherein the temperature is approximately 375°C.

12. A method of forming a nanowire according to any preceding
claim, wherein said nanoparticles catalytically assist a decomposition process,
20 said decomposition process providing the material to form the deposit of second
material around said one particle.

13. A method of forming a nanowire according to any preceding
claim, comprising depositing at least some of the second material to form a
25 deposit which surrounds the sides of said nanowire.

14. A method of forming a nanowire according to claim 13, wherein
the nanoparticles comprise carbon and the method further comprises an
annealing process which causes the carbon from the nanoparticles in the
30 nanowire to migrate into the second material surrounding the nanowire.

15. A method of forming a nanowire according to any preceding claim, wherein the deposit of second material comprises graphite, defective graphite, amorphous carbon and/or carbon fiber.

5 16. A method of forming a nanowire according to claim 15, wherein the deposit of second material comprises a plurality of layers of graphite and/or defective graphite.

10 17. A method of forming a nanowire according to any preceding claim, wherein the nanowire is substantially linear.

18. A method of forming a nanowire according to any preceding claim, wherein the nanoparticles are provided in the form of an agglomerated mass of nanoparticles.

15 19. A method of forming a nanowire according to claim 18, wherein a plurality of different nanowires is formed from a single agglomerated mass of nanoparticles.

20 20. A method of forming a nanotube comprising:
 (a) providing an arrangement of nanoparticles comprising a first material;
 (b) providing a fluid of halogenated molecules;
 (c) depositing at least some second material from said halogenated molecules onto an exterior surface of one of said nanoparticles to form a first deposit of second material which surrounds at least part of the exterior of said one nanoparticle; and
 (d) depositing at least some further second material from said halogenated molecules so as to attach a second deposit of said second material onto said first deposit, to produce an arrangement of deposits in the form of a nanotube.

21. A method of forming a nanotube according to claim 20, wherein the fluid of halogenated molecules comprises decomposition products produced from a polymer.

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22. A method of forming a nanowire, substantially as hereinbefore described.

23. A method of forming a nanotube, substantially as hereinbefore
10 described.